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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/029,659	10/22/2001	Otto J. Prohaska	03141-P0380A WWW/DC	4969
24126	7590	07/10/2006	EXAMINER	
ST. ONGE STEWARD JOHNSTON & REENS, LLC			OLSEN, KAJ K	
986 BEDFORD STREET			ART UNIT	
STAMFORD, CT 06905-5619			PAPER NUMBER	

1753

DATE MAILED: 07/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/029,659

Applicant(s)

PROHASKA ET AL.

Examiner

Kaj K. Olsen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 20 April 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 20, 21 and 23-32 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 20, 21 and 23-32 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 20, 21 and 23-32 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 20, 21 and 23-32 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. Applicant has replaced the previous “since inception” with --during a manufacturing process--. Although this overcomes the examiner’s previous objection to “since inception” and the examiner believes the applicant has support for --during a manufacturing process--, the claims 20 and 31 still specify that the membrane “is without equilibration”, which would appear to be another way of stating that the membrane never has been equilibrated (i.e. if the membrane had previously been equilibrated, then it would no longer be “without equilibration”). However, as the examiner has argued before, it is unclear if this is actually true. In particular, the

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Encyclopedia of Polymer Science and Engineering and Aldrich appears to evidence that the Nafion 117 presumably already underwent a process that reads on the applicant's defined equilibration. In particular, because it teaches that Nafion is made in the sodium ion form, but that this can be converted to other forms by immersion in an electrolyte (see p. 399). Aldrich teaches that Nafion 117 (an ionomer utilized by the instant invention) is sold in its hydrogen ion (i.e. acidic) form. How did the Nafion get into the acidic or hydrogen ion form without some process that reads on the applicant's defined equilibration (i.e. soaking it in an acidic electrolyte)? This is further evidenced by Shen (USP 5,650,054), which teaches that the commercially available hydrogen form of Nafion is first converted back into the sodium form (col. 15, ll. 21-24) and reconverted to the hydrogen form by soaking in an acidic solution (col. 16, ll. 17-20). This would indicate that soaking the synthesized sodium form of Nafion in an acidic solution would have been an obvious manner of creating the commercially available hydrogen ion (i.e. acidic) form of Nafion. Again, although the examiner believes the applicant is permitted to state that the membrane was without equilibration during the manufacturing of the gas sensor itself (i.e. applicant has support for stating that the membrane "has been without equilibration during a manufacture process"), applicant's earlier "without equilibration" is an unqualified statement that covers the membrane not only during the gas sensor manufacturing process, but also in the other time periods of the membrane presumably prior to the gas sensor manufacturing process. Because the available evidence by the examiner appears to indicate that the Nafion 117 utilized by the applicant was already pre-equilibrated, applicant does not have support to state that the membrane is an unqualified "without equilibration".

***Claim Rejections - 35 USC § 103***

6. Claims 20, 21 and 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 1 037 041 A2 (hereafter “EP ‘041”) in view of any one or more of Lawrance et al (USP 4,272,353) or Debe et al (USP 6,319,293) with or without the further teaching of Aldrich Chemical Catalog.

7. The claims remain rejected over the teachings of EP ‘041 in view of Lawrance or Debe as set forth in the previous office action. Applicant traverses this rejection. With respect to the use of Debe, applicant urges that Debe was soaked in a solution during the membrane electrode assembly. However, as the examiner set forth in the previous office action, Debe urges that this pre-soaked can be dispensed with if so desired. See paragraph 9 of the previous office action (sentence beginning “[a]lthough Debe...”). Hence, Debe teaches that the membrane does not require this pretreatment with moisture. With respect to the use of Lawrance (which the applicant refers to as “Lawrence”[sic]), applicant urges that the membrane of Lawrance was hydrated in de-ionized water in col. 12, ll. 1-50. The applicant is correct, but this hydration step occurred *after* Lawrance constructed its membrane electrode assembly (MEA). In particular, Lawrance formed the electrode and membrane structure and only after this structure was completed (col. 11, l. 62 through col. 12, l. 40) did they then hydrate (or equilibrate) the membrane electrode assembly (col. 12, ll. 41-48). In other words, Lawrance does not wet the membrane until after the electrode has been affixed to the membrane. The examiner notes that the instant invention even suggests hydrating or equilibrating the sensor after it has been constructed. See paragraph 00068 of the specification and claims 27 and 28. The examiner fails to

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understand why applicant believes that Lawrance's post-hydration step is any different from the post-hydration step of the instant invention.

8. Moreover, the claims no longer state that the membrane must remain without equilibration since inception, but are now without equilibration merely during "a manufacturing process". The term "a manufacturing process" is singular and could read on anything from the entire manufacturing process to a mere single step of a manufacturing process. Hence, even if the applicant's arguments concerning Debe and Lawrance were convincing, both Debe and Lawrance do teach a step of not equilibrating the membrane during a manufacturing process. For Debe, this would be any period before the solvent pre-treatment. For Lawrance, this would be the entire period prior to the post hydration step of the MEA.

9. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over EP '041 in view of Lawrence or Debe (with or without Aldrich) as applied to claim 20 above and in further view of LaConti et al (USP 4,820,386).

10. The references set forth all the limitations of the claim and EP '041 further disclosed the presence of a layer (2 or 22) for slowing inputs of gas moving through the at least one opening. However, EP '041 did not explicitly disclose that said layer could be a polymer. LaConti teaches this layer can comprise polymers. See col. 3, ll. 62-65; col. 5, ll. 49-58 and col. 6, ll. 59-68. It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of LaConti for the method of EP '041 and Lawrance or Debe because the substitution of one known diffusion material for another requires only routine skill in the art.

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11. Claims 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP '041 and either Lawrence or Debe (with or without Aldrich) as applied to claim 20 above, and further in view of Shen et al (USP 5,650,054).

12. The references set forth all the limitations of the claims, but did not explicitly recite the presence of a reservoir. However, Shen discloses utilizing a reservoir to ensure that the membrane remains hydrated regardless of the humidity level of the air. See col. 7, ll. 50-61. It would have been obvious to one of ordinary skill in the art at the time the invention was being made to add the reservoir of Shen to manufacturing of EP '041 in view of Lawrence or Debe in order to manufacture a sensor that provides consistent response regardless of humidity level of the measured gas.

13. Claims 29-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP '041 in view of either Lawrence or Debe (with or without Aldrich) with evidence from, or in further view of, Beech et al (Carbon Monoxide Sensors, Electrochemistry at Loughborough, pp. 1-4, 1999).

14. These claims differ from claim 20 in specifying the presence of a hole in the dry ionomer membrane. However, this broadly defined "hole" would read on any pores that might be present in the ionomer membrane itself. Beech evidences that Nafion inherently has gas permeability and water diffusion properties. See p. 2. In order for Nafion to provide gas permeability and water diffusion, Nafion must possess some degree of porosity and this degree of porosity would read on the claimed "hole" giving the claim language its broadest reasonable interpretation.

15. Alternatively, even if all forms of Nafion are not gas permeable and water diffusible and Beech cannot be utilized to evidence that the particular Nafion of EP '041 was gas permeable

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and water diffusible, Beech is drawn to a gas sensor and teaches that gas permeability and water diffusion properties of the Nafion desired for its sensor. Presumably, these properties are desired because a hydrated Nafion has an improved sensor response (see discussion of Shen above) and the permeability would improve the sensitivity and response time of the sensor. It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Beech for the method of EP '041 in view of Lawrance or Debe in order to improve the sensitivity, sensor response and response times for the sensor.

16. Claims 20, 21 and 24-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Prohaska et al (USP 6,682,638) in view of either Lawrance or Debe with or without Aldrich.

17. The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(l)(1) and § 706.02(l)(2).



18. These claims remain rejected over Prohaska and any of Debe or Lawrence for the reasons set forth in the previous office action. With respect to applicant's traversal of the use of Debe and Lawrence, the examiner addressed these arguments in the rejection over EP '041 in view of Debe or Lawrence above. Moreover, the examiner also discussed above why the teachings of Debe and Lawrence would apply to the claims even if the examiner were persuaded by these arguments. In short, the claims no longer state that the membrane must remain without equilibration since inception, but are now without equilibration merely during "a manufacturing process". The term "a manufacturing process" is singular and could read on anything from the entire manufacturing process to a mere single step of a manufacturing process. Hence, even if the applicant's arguments concerning Debe and Lawrence were convincing, both Debe and Lawrence do teach a step of not equilibrating the membrane during a manufacturing process. For Debe, this would be any period before the solvent pre-treatment. For Lawrence, this would be the entire period prior to the post hydration step of the MEA.

19. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Prohaska in view of any one or more of Lawrence or Debe as applied to claim 20 above and in further view of LaConti.

20. This claim differs by setting forth the use of a polymer layer over the electrode. This claim is rendered obvious in view of LaConti for the same reasons given above.

### ***Response to Arguments***

21. The examiner addressed the arguments in body of the rejections above and will not reiterate those here.

*Conclusion*

22. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kaj Olsen whose telephone number is (571) 272-1344. The examiner can normally be reached on Monday through Friday from 8:00 A.M. to 4:30 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen, can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

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applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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July 3, 2006



**KAJ K. OLSEN**  
**PRIMARY EXAMINER**